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EVALUATION OF SOUTHERN PINE BEETLE INFESTATIONS ON THE NATIONAL FORESTS IN TEXAS

by

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INTRODUCTION

Aerial sketch-map surveys were conducted during late July and early August on the Sam Houston, Angelina, Sabine, and Davy Crockett National Forests by district personnel. Subsequent ground examinations were conducted in July and August by the Alexandria Field Office of the Forest Insect and Disease Management Group. The purpose of the evaluation was to determine the current status of the southern pine beetle on all districts of the Texas National Forests.

The continuing southern pine beetle outbreak on the National Forests in Texas started in the early 1960's and has fluctuated from endemic to epidemic since that time on the various districts (Overgaard, 1976). The current survey indicated decreased beetle activity on all National Forests in Texas.

METHODS

A 100 percent aerial sketch map survey[2/] of federal land within protection boundaries of the Forests was conducted by district personnel and was used for the aerial portion of the evaluation. Then, 10 or more spots on each district were ground checked by Forest Insect and Disease Management personnel. A total of 63 spots were examined on the National Forests in Texas.

RESULTS AND DISCUSSION

The results of this biological evaluation are summarized individually by district and cumulatively in Table 1. Both the aerial and ground results indicate that overall southern pine beetle activity on all National Forests in Texas has diminished. Infestations detected from the air on federal lands in east Texas totaled 646, of which 340 were

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2/ Detection of Forest Pests in the Southeast.—1970. USDA, USFS, SA, S&PF, Div. of FPM, Publ. S&PF-7, Atlanta, GA 51 p.

Table 1. Summary of results of southern pine beetle evaluation on the National Forests in Texas, (July-August 1977)

	Ownership Unit (Districts)							
	Trinity	Neches	San Jacinto	Raven	Angelina	Yellowpine	Tenaha	Total
1. Results compiled from data collected during the aerial phase of the evaluation:								
Survey type				100 percent Aerial Sketch Map				
Date of survey	7/29	7/29	8/15	7/14	7/20 & 7/28	7/29	7/22	
Total acreage surveyed[1/]	81,216	80,435	58,409	99,796	154,392	100,933	82,911	658,092
Total susceptible host type acreage[2/]	81,216	69,934	53,082	91,279	125,738	72,037	70,782	564,068
Total number of spots	19(23)[3/]	52(97)[3/]	51(138)[3/]	151	77(133)[3/]	23(44)[3/]	36(65)[3/]	409(500)[3/]
Spots/M acres host type	.24	1.4	2.6	3.2	1.1	.61	.92	18.4
Average spot size (trees)	11.0	7.3	9.4	3.7	9.5	4.9	7.9	7.7
Range of spot size	1-20	1-15	1-75	1-20	1-25	1-5	1-25	1-75
2. Results compiled from data collected during ground phases of the evaluation:								
Date of ground phase	8/2 & 3	8/2 & 3	8/16 & 17	7/20 & 21	8/2 & 3	8/4 & 5	7/26	
Infested trees/M acres of host type	.77	3.65	15.0	6.45	1.06	.61	.92	28.46
Total number of infested trees within survey boundary	62	252	795	587	534	198	334	2,762
Ratio of green infested to total red and fading trees	1:12.0	1:5.0	1:4.0	1:0.7	1:22.5	1:11.0	1:6.0	1:9.7
Total volume of infested trees (MBF)	7.25	44.15	105.62	64.57	80.9	23.07	23.4	384.96
Total volume of affected trees (MBF)[4/]	31.01	175.26	233.63	143.0	187.2	42.67	77.60	890.37
Total volume affected during peak period of beetle activity	190.3	285.0	1041.0	116.0	240.0	137.7	1351.0	3361.00

1/ Includes federal land only.
2/ Acreage with 25 percent or more pine was considered host type.
3/ Data corrected according to Aldrich and Heller.
4/ Affected volume includes trees (grey, red, fading, green) that are dead or dying as a result of southern pine beetle.

single-tree spots. Compared to last year at this time, this represents a 38 percent decrease during what is generally considered the peak period of southern pine beetle activity in east Texas.

Sam Houston National Forest-

Declining beetle populations were particularly evident on the San Jacinto Ranger District where approximately 684 multiple-tree infestations were reported between October and August 1976. This year, 274 multiple-tree infestations were reported as of August 1977. Many of these infestations, especially since March, were either inactive or going inactive. Aerial data corrected according to Aldrich and Heller (1958) showed 138 infestations on San Jacinto this August, 42 percent being single-tree spots. When combined with the data obtained from the Raven District, there were 289 estimated southern pine beetle infestations on the Sam Houston National Forest at the time of this evaluation. Of the 151 infestations observed on the Raven District, 56 percent of them were single-tree spots. The remaining multiple-tree spots ranged from 2 - 20 trees.

Ground examinations revealed little or no spot growth. All spots visited on both districts were in decline.

Angelina National Forest-

On the Angelina National Forest, southern pine beetle population levels were down from last year, but not yet endemic. Data obtained from aerial presuppression flights revealed 77 (133 corrected) additional infestations during the last week of July. Forty-four percent of these were identified as single-tree spots.

Subsequent ground examinations of 329 southern pine beetle-affected trees showed 41 percent to be actively infested with brood. Only four percent of the trees checked were green infested. This conspicuous absence of green infested trees substantiated a decreasing population trend.

Total trees affected at the time of this evaluation were estimated at 1,576, one-third of which were actively infested with brood. Compared to last year at this time, this represents a 68 percent decrease in southern pine beetle infested trees on this forest.

Davy Crockett and Sabine National Forests-

The lowest levels of southern pine beetle activity on federal lands were observed on the Trinity (Davy Crockett National Forest) and Yellowpine (Sabine National Forest) Ranger Districts. Beetle populations on these two districts appeared to be near endemic. Infestations detected from the air totaled 23 on the Trinity and 44 on the Yellowpine. All of the spots ground checked were either inactive or proceeding in that direction.

Infestations on the Neches (Davy Crockett National Forest) and Tenaha (Sabine National Forest), however, were near epidemic levels. Infestations were more numerous and significantly larger than those found on the Trinity and Yellowpine Districts. Forty percent of the infestations visited were actively infested. However, the ratio of red vacated to green infested were 6:1 on the Tenaha and .89:1 on the Neches. This suggests that although many of the infestations were active, they were proceeding towards inactivity.

Almost all of the southern pine beetle infestations visited on federal lands in east Texas occurred in sawtimber stands 45 - 55 years of age. The average d.b.h. of the trees in these stands was between 14 - 16 inches. Basal areas of the infestations examined ranged between 80 - 270 square feet per acre. The average total pine-hardwood basal area, however, was between 140 and 150. This implies that the majority of the stands 45 - 55 years of age on federal lands in east Texas are currently overstocked and, therefore, highly susceptible to further southern pine beetle attack. The absence of spot growth and presence of large numbers of recently vacated red and fading trees further suggests that the beetles may, in fact, be dispersing into these susceptible stands. That spot proliferation is occurring is also indicated by the large volume of sawtimber recently salvaged controlled by all forests during the month of September, 566.7 MBF. Therefore, although the southern pine beetle on federal lands in east Texas has decreased in relation to last year, the beetle population has not collapsed, but remains critical.

Ninety percent of all infestations examined were associated with some kind of stand disturbance. Lightning strikes were the most commonly encountered on all districts. Additional stand disturbances also included unusually high populations of black turpentine beetles and Ips beetles. Breakouts of previously controlled spots were always associated with Ips beetles, particularly on the Tenaha Ranger District and parts of the San Jacinto Ranger District. The Ips beetles were probably attracted to these recently controlled spots by the fresh slash. However, frequency of breakout of previously controlled spots was less than 10 percent.

Although we can't predict the rate of infestation increase without project suppression nor the actual rate of infestation increase with project suppression with any certainty, we believe they will be less than estimated last year. Last year the rates of increase were 6 and 2. This year, based on results of this evaluation, conversations with district personnel, and the unusually high populations of black turpentine beetles and Ips beetles, we estimate 5 and 1.6, respectively. Volume salvage controlled by all Texas National Forests during FY 77 exceeded 16,000 MBF. During FY 78, it is estimated that between 6,000 to 10,000 MBF of southern pine beetle affected timber will be salvage controlled.

RECOMMENDATIONS

It is currently recommended that southern pine beetle suppression activities be continued on the Angelina, Sam Houston, Davy Crockett, and Sabine National Forests. Suppression efforts, however, should be concentrated on those districts having heaviest areas of beetle activity. All districts should continue suppression efforts in accordance with the Southern Pine Beetle Control Plan for the National Forests of Texas and FSM 5250. Suppression efforts should be accelerated as necessary to cope with increasing beetle populations. Chemical control is especially encouraged in controlling infestations which are of nonmerchantable age, currently inaccessible or inoperable.

It should also be remembered that the southern pine beetle is a natural part of the southern pine forest and will never be completely eliminated. Direct suppression activities are also, at best, a temporary solution. To decrease future losses from this beetle, predisposing factors leading to stand susceptibility (overstocked stands, diseased stands, stands weakened by storm damage, excess moisture, etc.) will have to be corrected or eliminated through long-term pest management goals and silvicultural procedures.

LITERATURE CITED

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POST SUPPRESSION EVALUATION OF THE NATIONAL FORESTS IN TEXAS

by

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INTRODUCTION

The purpose of this evaluation is to help the forest and districts with southern pine beetle suppression projects evaluate their FY 77 project. It is an attempt to summarize reported accomplishment and to document the successes and problems encountered by the districts while doing SPB suppression work. It is hoped that by reviewing past projects, better decisions can be made concerning project planning, organizing, directing, and controlling. This may also help in future target setting, fund allocation, and accomplishment reporting.

Four National Forests in Texas had Southern Pine Beetle Suppression Projects in FY 77 (Davy Crockett, Sabine, San Jacinto, and the Angelina N.F.).

Project cost was based on an estimated need to salvage 8,573 MBF for SPB control. Also, it was estimated that 8,270 trees would need to be chemically treated to effect SPB control. To do this, presuppression flights covering 7,320,000 acres were planned. The total amount of the funding provided for the project was $138,376. Of this amount, $106,536 was actually available for the districts to do the work. This funding was received in June 1977. Table 1 contains a comparison of Project targets versus reported accomplishments.

Target Setting and Insect & Disease Management Reporting System (IDARS) -

A Project Proposal (5200-10 and related documents) was submitted for each Forest where the SPB was expected to cause unacceptable loss. Salvage control (MBF), chemical control (stems), and presuppression (acres) targets were set up based on current entomological knowledge. Although some estimates can be made, SPB activity cannot be accurately predicted a year in advance. For this reason, the estimated targets may not reflect what actually happened on a forest during the project year.

The project took into account the funding for presuppression flights, chemical control, salvage control, and indirect services of the

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Table 1. Project accomplishments as reported on IDARS

Target Areas	Angelina	Neches	Trinity	Teneha	Yellowpine
Stems chemically treated	52.80	500	949	--	--
Presuppression acres	1,252,800	650,000	167,310	994,908	972,000
Salvage MBF	2,908.17	2,023.77	802.99	2,790.95	778.19
Funds spent	$ 3,263.00	$5,707.00	$4,288.00	$ 5,406.00	$ 8,685.00

	Raven	San Jacinto
Stems chemically treated	103	918
Presuppression acres	792,000	584,060
Salvage MBF	1,377.77	5,560.14
Funds spent	$ 2,164.00	1,293.00

Totals:	Project targets	Data as reported on IDARS
Funding available	$ 106,536	$ 30,806.29
Salvaged MBF	8,573	16,241.98
Chemically treated	8,270	2,522.80
Presuppression acres	7,320,000	5,413,078

Supervisor's Office. When IDARS figures do not match project figures, it may be due to a change in SPB activity, to inconsistencies in accomplishment reporting, or to districts not able to get the work done. Some reasons for this include inoperability, poor markets, few operators, late funding, and district commitment to get the work done. If accomplishment reporting problems become apparent, FI&DM should give adequate training to insure that districts know how to report project accomplishments correctly.

Funding -

The National Forests in Texas received funding late (June 1977) in the year. This delay caused a loss of efficiency in salvage control work. Funding should be spread out over the project years to be used to the best advantage.

Weather -

Chronic SPB populations still exist in Texas in spite of a colder than normal winter in FY 77.

Market Conditions -

Market conditions varied in FY 77. Sawtimber had a very competitive market. Pulpwood was harder to sell since most of the districts are not near paper mills. Most operators were therefore reluctant to take pulpwood when associated with sawtimber in a SPB spot. Some chemical control was used to supplement salvage control when necessary to accomplish SPB control.

Operator Reliability -

Angelina - This district salvaged a large volume of wood in FY 77. Most of this volume was sawtimber. The operators on this district generally did satisfactory work. No breakouts were noted on the district.

Neches - The Neches District had reported some problems with operator reliability. One breakout of a salvaged spot and other unsatisfactory control procedures were noted when FI&DM personnel ground checked the district with district personnel. Pulpwood size timber that was infested was left in the spot that eventually broke out. The district could encourage better salvage operations by denying bids to unreliable operators and by continuing to do post control checks. The overall control effort on this district was satisfactory. This was due to the district's persistence in doing post control checks. These checks will confirm the effectiveness of operators and will find breakouts before they become large in size.

Trinity - The Trinity District had problems in selling small pulpwood SPB spots. There were only a few operators willing to take pulpwood due to the long distance to markets. Also, the market demand stayed quite low during FY 77. No breakouts were noted on the district during FY 77. Ground checking by FI&DM helped to confirm that the salvage control effort on this district was satisfactory in FY 77.

Teneha - New personnel were being trained to do SPB suppression work (district personnel) when this district was ground checked for the SPB Biological Evaluation by FI&DM personnel in August 1977. One SPB breakout was discovered during ground checking. This spot was used as an example to help train the new SPB control personnel for the district. The district has reported problems in getting the operators to complete the salvage removal as specified in the contract. The district did not have enough personnel to integrate a chemical control action with salvage control. The best solution, then, is that the district should continue to do post suppression checks and to contract only with timber operators willing to complete the job according to contract and to hire additional people as necessary to do chemical control.

Yellowpine - This was another district that had problems selling small pulpwood spots in FY 77. Most operators were geared to salvage sawtimber. Lack of a market for pulpwood had a great influence on operators in FY 77. No breakouts were reported in FY 77, but the sub-epidemic status of the beetle probably influenced this as much as the control effort. A chemical effort was not initiated by the district due to lack of personnel. The control effort on this district was satisfactory for FY 77, but it is doubtful if this could continue under an epidemic situation. This statement is made considering the market and personnel situations.

Raven - This district has reported no breakout problems for FY 77. The market improved for pulpwood in FY 77, hence more operators were willing to bid on pulpwood salvage. Operator performance was monitored during the summer of 1977, as a part of a pilot project by S&PF. The operators were generally observed to do an acceptable job of SPB salvage control for FY 77.

San Jacinto - The San Jacinto District has reported no problems with SPB control due to operator reliability. Most operators are knowledgeable and provide adequate control effort to control SPB spots. The SPB control effort on this district was satisfactory.

Personnel -

District personnel were able to do all necessary work except some follow-up chemical control. This was due to lack of personnel. The harvesting restrictions on the National Forests in Texas require the

use of more time by district personnel to mark conventional timber sales. This, plus the time spent on salvage control, left less time for chemical control work. No temporary people were hired in FY 77 due to the timing of the funding. As a result, SPB control projects suffered, especially when chemical control was intended.

Unit Plans -

There has been little recent FI&DM input into Timber Management and Unit Plans for the National Forests in Texas. Since new plans are being developed, there now is a good opportunity to consider long range preventative measures for insect and disease management. FI&DM entomologists and pathologists are available to assist the Forest and Districts as these plans are written.

Timber Sales -

The size of timber sales varied on the National Forests in Texas in FY 77. Most pulpwood sales are small ticket sales. Sawtimber sales range from very small to several thousand board feet. Sales that require bids usually take from 10 - 17 working days to get salvage control completed. Some districts have private operators that flew on their own in addition to the districts' presuppression flights (Teneha). When these operators fly and scout the SPB spot, the control time can be reduced by three to five working days.

Conclusion -

The late arrival of funding in FY 77 interfered with Project administration. This reduced needed chemical control work and reduced the efficiency of the overall project. Breakouts were not generally a problem, but this could have been due to the static SPB population, as well as the control efforts of the districts. It should be noted here that the Post Control checks are an important part of a successful SPB control project. Districts making the effort to do these checks properly greatly increase the effectiveness of their work.

Preventative measures should be addressed in future Timber Management and Unit Plans. Again, FI&DM personnel are available to help with this.

The overall control effort in FY 77 was satisfactory, but there were some problems with accomplishment reporting. FI&DM will help train district personnel on the IDARS reporting system. This should help to reduce reporting errors in the future.